

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 94-120
NPDES NO. CA0028185

RENEWAL OF WASTE DISCHARGE REQUIREMENTS FOR:

FAIRCHILD SEMICONDUCTOR CORP. AND SCHLUMBERGER TECHNOLOGY
CORP.
101 BERNAL ROAD, SAN JOSE
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region,
(hereinafter the Board) finds that:

1. Fairchild Semiconductor Corporation and Schlumberger Technology Corporation (hereinafter the discharger), by application dated July 19, 1993, and revised August 30, 1993, has applied for renewal of waste discharge requirements and a permit to discharge waste under the National Pollutant Discharge Elimination System (NPDES). The discharger is currently discharging wastes pursuant to Order No. 89-015, adopted on January 18, 1989, and subsequently amended by Order No. 90-056, adopted on May 16, 1990.
2. The discharger owned and operated a semiconductor manufacturing facility located at 101 Bernal Road, San Jose. The facility operated from 1977 through 1983 and has been inactive since. The property was sold to SRDC, Inc., in 1990; SRDC intends to redevelop the site as a retail shopping center.
3. Subsurface investigations at the site have detected various chemicals, including 1,1,1-trichloroethane (TCA), 1,1-dichloroethene (DCE), xylene, acetone, and isopropyl alcohol, in both soils and groundwater at the site. Some of these chemicals are found in off-site groundwater. Since 1982, the discharger has been extracting groundwater to prevent further migration of these chemicals and to remediate affected groundwater.
4. The discharges from the facility include the following:

Waste Number and Description	1993 Average Flow Rate (gal/day)
001 Extracted groundwater from on-site wells, discharged to storm drain	115,000
002 Extracted groundwater from on-site wells,	0

recharged to groundwater

003 Extracted groundwater from off-site wells,
discharged to storm drain 0

004 Extracted groundwater from off-site wells,
reused for irrigation or construction activities 0

5. Waste 001: Prior to October 1993, on-site groundwater extraction was cyclic (one month on at a rate of about 72,000 gallons per day and two months off). Subsequently, groundwater extraction was increased to about 130,000 gallons per day on a continuous basis, in order to maintain stable groundwater elevations within the slurry wall surrounding the site. Groundwater is treated by air stripping followed by carbon adsorption. Treated groundwater is discharged to a storm drain tributary to Canoas Creek.
6. Waste 002: The discharge submitted an April 22, 1944, proposal to recharge treated groundwater from the on-site treatment system at a location just outside the slurry wall at the northern corner of the site (near well WCC-37). The recharge rate would be sufficient to eliminate the need for surface-water discharge from the on-site treatment system. Groundwater would recharge the same hydrogeologic unit from which it was extracted (B-zone). Design and implementation of the recharge project is contingent on site redevelopment plans, which will determine the placement of conveyance pipelines and the on-site treatment system. Site redevelopment plans will be finalized by late 1994.
7. Waste 003: Prior to December 1991, off-site wells extracted up to 9 million gallons per day of groundwater. Groundwater was treated by nozzle aeration and then discharged to a storm drain tributary to Canoas Creek. In December 1991, the Board approved a temporary shut-down of the off-site extraction system, based on reduced chemical concentrations and declining chemical-removal rates. Off-site extraction may resume if necessary to prevent chemical migration.

Minor volumes of groundwater are discharged intermittently from off-site extraction wells in order to obtain groundwater samples or perform necessary well-maintenance tasks.

8. Waste 004: When off-site extraction wells were in operation, a small portion of the treated wastewater was reused for irrigation at a nearby farm (Live Oaks Farm) and for construction purposes. Tanker trucks were used to convey treated wastewater to off-site construction sites. This reuse activity ceased when off-site extraction was temporarily halted.
9. The discharger may chlorinate extraction and recharge wells in order to prevent well

plugging and mechanical difficulties. Due to its toxicity to aquatic life, chlorine must be removed prior to any surface water discharge.

10. Surface water discharge: Wastes 001 and 003 are discharged via the City of San Jose storm drain system to Canoas Creek where it crosses Cottle Road (Latitude 37°14'7" and Longitude 121°48'11"). Canoas Creek is tributary to the Guadalupe River flowing to South San Francisco Bay.
11. Basin Plan Requirements: The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 17, 1986. The Board amended its Basin Plan on September 16, 1992, and the State Board approved it on April 27, 1993, with approval from the State Office of Administrative Law pending. Section 1 of the 1992 Basin Plan amendments, "Implementation of Statewide Plans," was remanded by the State Board on June 16, 1994, due to its reliance on two Statewide Plans that are no longer legally in effect. The Basin Plan identifies beneficial uses and water quality objectives for surface and ground waters in the region, as well as discharge prohibitions intended to protect beneficial uses.
12. Beneficial Uses: The Basin Plan identifies the following existing and potential beneficial uses of Guadalupe River and its tributaries:
 - a) water contact and non-contact recreation
 - b) wildlife habitat
 - c) cold freshwater and warm freshwater habitat
 - d) fish migration and fish spawning
 - e) groundwater recharge

The Basin Plan identifies the following existing and potential beneficial uses of groundwater underlying and adjacent to the facility:

- a) industrial process water supply
 - b) industrial service water supply
 - c) municipal and domestic water supply
 - d) agricultural water supply
13. Basin Plan Prohibitions: The Basin Plan prohibits discharge of wastewater which has "particular characteristics of concern to beneficial uses" (a) "at any point in San Francisco Bay south of the Dumbarton Bridge" and (b) "at any point where the wastewater does not receive a minimum initial dilution of at least 10:1 or into any nontidal water, dead end slough, similar confined water, or any immediate tributary thereof." An exception to these prohibitions is warranted because (i) this discharge is an integral part of a groundwater remediation program and thereby provides a net environmental benefit and (ii) water reuse and reclamation will be optimized.

The Basin Plan prohibits discharge of "all conservative toxic and deleterious substances, above those levels which can be achieved by a program acceptable to the Board, to waters of the Basin." The discharger's groundwater extraction and treatment system and associated operation, maintenance, and monitoring plan constitutes an acceptable control program for minimizing the discharge of toxicants to waters of the State.

14. Regional Board Resolution 88-160: Resolution 88-160 strongly encourages dischargers of extracted groundwater from site cleanup projects to reclaim their effluent, or when not technically or economically feasible, to discharge to a POTW. If neither reclamation nor discharge to a POTW is feasible, and if beneficial uses of the receiving water are not adversely affected, then the Board will approve of the discharge as part of a groundwater cleanup project. This discharge is in compliance with Resolution 88-160, in that reuse has been optimized and discharge to the San Jose/Santa Clara POTW is infeasible.

15. Effluent Limitations

Effluent limits in this permit are based on the plans, policies, and water quality objectives and criteria of the Basin Plan, "Quality Criteria for Water" (EPA 440/5-86-001, 1986 Gold Book), applicable Federal Regulations (40 CFR Parts 122 and 131), the National Toxics Rule (57 FR 60848, December 22, 1992), State and Federal maximum contaminant levels (MCLs), US EPA Region 9 draft guidance (NPDES Permit Limitations for Discharge of Contaminated Groundwater), Best Available Technology Economically Achievable (BAT), and Best Professional Judgement.

Effluent limits for individual VOCs are the more stringent of 5 ug/l or the current drinking water standard, except as noted below. The technology to achieve the 5 ug/l maximum is expected to achieve concentrations at or below 0.5 ug/l (the current method detection limit) most of the time. For 1,1,1-TCA offsite, the effluent limit is 50 ug/l. This limit reflects the impracticability of most treatment methods for the very large flows produced by off-site extraction wells and the performance constraints of nozzle-aeration, and is well below the drinking water standard for this constituent. For acetone and isopropyl alcohol, the effluent limits are 500 ug/l and 700 ug/l, respectively. These limits reflect their relatively low volatility, relatively poor removal using air-stripping technology, and their relatively low toxicity for humans and aquatic life.

In the Board's Best Professional Judgement, limited dilution credit (two times the water quality objective) is appropriate in establishing effluent limits for metals, for the following reasons unique to groundwater cleanup discharges. These are temporary discharges, which will cease when groundwater cleanup standards are met. These discharges are likely to often exceed effluent limits for metals which do not provide allowance for dilution, with no feasible way to come into compliance. Source control

is not an option since metals are in ambient groundwater, and treatment of low-ppb concentrations of metals is not feasible at numerous small treatment units. Exceedances of water quality standards in receiving waters near these discharges are unlikely and, if present at all, very small in size and duration, due to the relatively small discharge volumes. Finally, these discharges do not contribute significant metals loadings in the region (less than 400 pounds per year, as estimated in the 1993 Board staff study cited above). With respect to mercury, a mass limit in lieu of a concentration limit is appropriate, given that mercury bio-concentrates in fish and shellfish tissue and given that the water quality objective for this constituent is based on human consumption of fish and shellfish. A limit of 1 gram/day represents a *de minimus* level and is consistent with the Board's 1991 general permit for fuels-cleanup discharges.

If violations of effluent limits for metals occur, the discharger will be required to evaluate the feasibility of treatment and/or the impacts of the exceedance to the receiving water. The Executive Officer will consider these evaluations and subsequent actions taken by the discharger when exercising enforcement discretion.

It is the Board's intent to replace concentration limits with mass limits for metals in the future. This will be done on a watershed by watershed basis, thereby assuring that all significant sources in a given watershed are managed properly to protect water quality. The transition to a watershed approach will be possible once non-point sources are better understood.

16. CEQA: This action is an Order to renew an NPDES permit for an existing surface water discharge. This action is exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 13389 of the California Water Code.
17. The Board has notified dischargers potentially subject to this Order and interested agencies and persons of its intent under Division 7 of the California Water Code to prescribe waste discharge Requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
18. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Division 7 of the California Water Code and regulations adopted thereunder and the provisions of the Clean Water Act as amended and regulations and guidelines adopted thereunder, that Fairchild Semiconductor Corp. and Schlumberger Technology Corp. shall comply with the following:

A. Prohibitions

1. The discharge of waste or hazardous materials in a manner which will degrade the water quality or adversely affect beneficial uses of the waters of the State is prohibited.
2. The discharge shall be limited to the waste streams described in the NPDES permit application and added anti-scaling or anti-biofouling chemicals approved by the Executive Officer which do not adversely affect the environment and comply with the requirements of this Order. Discharges of any other wastes are prohibited.
3. Discharge volume shall not exceed the following maximum flow rates (gallons per day) unless an increase in gallons per day is approved by the Executive Officer:
 - a. Wastes 001 and 002 combined (on-site treated groundwater) 175,000
 - b. Wastes 003 and 004 combined (off-site treated groundwater) 1,500,000
4. Discharges authorized by this permit shall not cause or threaten to cause pollution, contamination, or nuisance.

B. Effluent Limitations

The following effluent limits apply to the discharge at the point after full treatment but before the discharger relinquishes control of the discharge (Wastes 001 and 003) or before the discharge is released to waters of the state (Wastes 002 and 004).

1. Wastes 001-004 shall not contain constituents in excess of the following limits:

Constituent	Instantaneous Maximum Limit (ug/l) by Waste:			
	001	002	003	004

a. Purgeable Halocarbons (as detected by EPA Method 601 or its equivalent)				
1,1,1-Trichloroethane	5	5	50	50
Tetrachloroethylene	5	5	5	5
1,1-Dichloroethylene	5	5	5	5
1,2-Dichloroethane	0.5	0.5	0.5	0.5
Vinyl Chloride	0.5	0.5	0.5	0.5
1,2-Dichloroethylene	5	5	5	5
1,1-Dichloroethane	5	5	5	5
Methylene Chloride	5	5	5	5
Chloroform	5	5	5	5
Freon 113	5	5	5	5
Any other	5	5	5	5
b. Purgeable Aromatics (as detected by EPA Method 602 or its equivalent)				
Total Xylenes	5	5	5	5
Any other	5	5	5	5
c. Semi-Volatile Organics				
Acetone	500	500	--	--
Isopropyl alcohol	700	700	--	--
d. Inorganics				
Arsenic	10	--	10	--
Cadmium	2.2 ¹	--	2.2 ¹	--
Chromium (VI)	22 ²	--	22 ²	--
Copper	23.6 ¹	--	23.6 ¹	--
Lead	6.4 ¹	--	6.4 ¹	--
Nickel	320 ¹	--	320 ¹	--
Selenium	10	--	10	--
Silver	8.2 ¹	--	8.2 ¹	--
Zinc	220 ¹	--	220 ¹	--

¹ assumes hardness = 100 mg/l CaCO₃

² dischargers, at their option, may meet this limit as total chromium

2. Wastes 001 and 003 collectively shall not contain more than 1 gram/day of mercury.
3. Wastes 001-004 shall not contain concentrations of total residual chlorine (free chlorine plus choramines) in excess of 0.0 mg/l (instantaneous maximum).
4. The pH of any waste discharge shall not exceed 8.5 nor be less than 6.5.
5. Toxicity: The survival of rainbow trout in 96-hour bioassay of any waste discharge, shall be a three-sample median of 90% survival and shall not be less than 70%.

C. Receiving Water Limitations

1. The discharge of waste shall not cause the following conditions to exist in waters of the State at any place:
 - a) floating, suspended, or deposited macroscopic particulate matter or foam;
 - b) bottom deposits or aquatic growths;
 - c) alteration of temperature, turbidity, or apparent color beyond present natural background levels;
 - d) visible, floating, suspended, or deposited oil or other products of petroleum origin;
 - e) toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.
2. The discharge of waste shall not cause excursions of the following limits in waters of the State in any place within one foot of the water surface:
 - a) Dissolved oxygen: 5.0 mg/l minimum.

The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation.
 - b) pH: The pH shall not be depressed below 6.5 nor raised above 8.5,

nor caused to vary from normal ambient pH levels by more than 0.5 units.

3. This discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Federal Clean Water Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Clean Water Act or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

D. Water Reuse Specifications (Wastes 002 and 004 only)

1. No reused water shall be allowed to escape from use areas by airborne spray, nor by surface flow except in minor amounts associated with good irrigation practice, nor from conveyance facilities.
2. Reuse involving irrigation shall not occur when the ground is saturated.
3. Adequate measures shall be taken to minimize public contact with reused water and to prevent the breeding of flies, mosquitos, and other vectors of public health significance during the process of reuse.
4. Appropriate public warnings must be posted to advise the public that the water is not suitable for drinking. Signs must be posted in the area, and all reused water valves and outlets labelled, as appropriate.
5. There shall be no cross-connection between the potable water supply and piping containing treated groundwater intended for reuse.

E. Provisions

1. The discharger shall comply with all sections of this order immediately, except as described in provision 2 below.
2. The discharger shall comply with the following schedule for implementing groundwater recharge (Waste 002):

- a. COMPLETION DATE: April 15, 1995

TASK 1 - DESIGN OF RECHARGE SYSTEM: Submit a technical report acceptable to the Executive Officer which contains a design for the groundwater recharge system cited in finding 6. The design should

include: number of recharge wells, well location(s), well construction (e.g. screen interval), recharge rate(s), estimated zone of influence, conveyance piping from the treatment unit, and any other relevant information. The report should include a schedule for construction and implementation of the recharge system. Copies of the technical report should be provided to the Santa Clara Valley Water District and local water purveyors. The Executive Officer may modify the completion date for this task if delays in site redevelopment plans also delay this task.

- b. COMPLETION DATE: According to approved schedule in Task 1

TASK 2 - IMPLEMENTATION OF RECHARGE SYSTEM: Submit a technical report acceptable to the Executive Officer which documents start-up of the recharge system.

- c. COMPLETION DATE: One year after completion of task 2

TASK 3 - STATUS REPORT ON RECHARGE SYSTEM: Submit a technical report acceptable to the Executive Officer which contains a status report on the recharge system. The report should include: a summary of operation and maintenance procedures, recharge rate(s), monitoring data to show zone of influence in shallow groundwater, discussion of problems encountered and alternatives to address them, and any plans to modify the recharge system or its operation. Copies of the technical report should be provided to the Santa Clara Valley Water District and local water purveyors.

3. The discharger shall comply with the attached Standard Provisions except items C.1, C.2, D.2, D.3, E.5, and E.6.c. The discharger shall also comply with the attached Self-Monitoring Program.
4. Evaluation of Metals Effluent Limits Violations

If any inorganic effluent limit is exceeded then the discharger shall take three additional samples for that constituent(s) during the following quarter.

Case 1 If the results of the three additional samples for the effluent **do not** exceed the effluent limit(s) the discharger shall report the results to the Executive Officer in the next Self-Monitoring Report, and shall return to the schedule of sampling and analysis in the Self-Monitoring Program.

Case 2 If the results of **any one of the three** additional samples exceed

the effluent limit(s), the discharger shall perform the following:

- a) Calculate the median and maximum concentration values for the constituent(s) of concern, using the three recent samples **and all** samples collected and analyzed for that constituent in the previous 12 month period.
- b) Estimate the mass load discharged in the previous 12 month period for the constituent(s) of concern. Report the results in grams per day and in pounds per year, using the average flow rate for the previous 12 month period.
- c) Report the results to the Executive Officer in the next Self-Monitoring Report, and return to the schedule of sampling and analysis in the Self-Monitoring Program.

Case 3 If the results of **two or three** of the additional samples exceed the effluent limit(s), the discharger shall perform the following:

- a) Calculate median and maximum concentration values and mass load for the constituent(s) of concern, as described in Case 2 above.
- b) Perform a cost analysis for treatment of the discharge for the constituent(s) of concern. The analysis should include, but need not be limited to, a discussion of various treatment technologies or pre-treatment filtration options, the cost and technical feasibility of increased treatment to reduce the constituent(s) of concern, and the amount of reduction in terms of concentration and average annual mass load. A joint effort may be undertaken and submitted by more than one discharger to evaluate cost and feasibility of treatment technologies or options.

If the results of the cost analysis indicates that metals treatment of the discharge does not appear to be a feasible option, then:

- c) Perform an evaluation of the potential adverse impacts to the beneficial uses of the receiving water. The evaluation should include, but need not be limited to, description of the beneficial uses specific to the receiving water, physical and chemical characteristics of the water body and sediment, and the physical, chemical, or biological effects from the constituent(s) on the beneficial uses, including effects related to hardness for metals with hardness-dependent objectives.

If exceedances are only for metals with hardness-dependent objectives, then the discharger may conduct a hardness study prior to completing this task. The hardness study should assess receiving water hardness (as CaCO_3) and compute a "no effect" concentration for affected metals, using (i) the minimum of a statistically significant number of hardness samples, and (ii) hardness-dependent formula for US EPA freshwater criteria. If effluent metals concentrations fall below the computed "no effect" concentration, then the discharger need not complete the remainder of this task.

If the receiving water study finds that the discharge is having potential adverse impacts to beneficial uses of the receiving water, then:

- d) Evaluate control measures other than treatment to reduce the constituent(s) of concern in the discharge, such as re-evaluating options for re-use, discharge to POTW, or alternatives to groundwater extraction.
- e) Within 180 days of the discharger receiving results of the consecutive sampling, report the results of tasks (a) through (d) above to the Executive Officer, including:
 - the proposed method to eliminate or minimize future non-compliance, or
 - provide a rationale for why no change to the existing program should take place, and
 - return to the schedule of sampling and analysis in the Self-Monitoring Program.

The discharger may be required to perform additional evaluations or take additional actions to minimize noncompliance, as deemed necessary by the Executive Officer.

If a violation of the same effluent limit occurs less than 60 months after completion of the required tasks in Cases 1, 2, or 3, then the Executive Officer may waive the evaluation required above. This waiver will not apply if a different inorganic constituent exceeds the effluent limit. In that case, the discharger shall perform an evaluation for that constituent(s).

5. This permit may be modified prior to the expiration date to include effluent

limitations for toxic constituents determined to be present in significant amounts in the discharge through the Self-Monitoring Program included as part of this Order.

6. This Order expires September 21, 1999. The discharger must file a report of waste discharge in accordance with 23 CCR Subchapter 9 not later than 180 days in advance of this expiration date as application for NPDES permit renewal.
7. This Order shall serve as a general National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Federal Clean Water Act, or amendments thereto, and shall become effective at the end of ten days from date of hearing provided the Regional Administrator, U. S. Environmental Protection Agency, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.
8. This order supersedes and rescinds Orders 89-015 and 90-056.

I, Steven R. Ritchie, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on September 21, 1994.



Steven R. Ritchie
Executive Officer

Attachment: Standard Provisions (August 1993)
Self-Monitoring Program (Parts A and B)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF MONITORING PROGRAM

FOR

FAIRCHILD SEMICONDUCTOR CORP. AND
SCHLUMBERGER TECHNOLOGY CORP.
101 BERNAL ROAD
SAN JOSE, SANTA CLARA COUNTY

NPDES NO. CA0028185

ORDER NO. 94-120

CONSISTS OF

PART A (AUGUST 1993) AND
PART B (ADOPTED SEPTEMBER 21, 1994)

SELF-MONITORING PROGRAM
FAIRCHILD SEMICONDUCTOR CORP. AND
SCHLUMBERGER TECHNOLOGY CORP.
NPDES No. CA0028185

PART B

I. DESCRIPTION OF SAMPLING STATIONS

A. Influent

<u>Station</u>	<u>Description</u>
I-001/002	At a point in the on-site groundwater treatment system immediately prior to treatment and discharge/reuse.
I-003/004	At a point in the off-site groundwater treatment system immediately prior to treatment and discharge/reuse (may be more than one such point for multiple off-site treatment units).

B. Effluent

<u>Station</u>	<u>Description</u>
E-001/002	At a point in the on-site groundwater treatment system immediately following treatment but before any discharge/reuse.
E-003/004	At a point in the off-site groundwater treatment system immediately following treatment but before any discharge/reuse (may be more than one such point for multiple off-site treatment units).

C. Receiving Waters

<u>Station</u>	<u>Description</u>
C-001	At a point in Canoas Creek at least 100 feet downstream from the point where waste from the on-site and off-site groundwater treatment systems discharges to the creek.

II. SCHEDULE OF SAMPLING AND ANALYSIS

Parameter	I-001	E-001	I-003	E-003	
or Constituent	I-002	E-002	I-004	E-004	C-001

Key: I = Intermittent M = Monthly
D = Daily Q = Quarterly
W = Weekly A = Annually


- ### III. MODIFICATION OF PART A

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quarterly SMRs due 45 days after the end of the calendar quarter. Section F.5 (annual reports) is modified to allow 45 days after the end of the calendar year for report submittal.

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in Regional Board Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Regional Board Order No. 94-120.
2. Was adopted by the Board on September 21, 1994.
3. May be revised by the Executive Officer pursuant to EPA regulations (40 CFR 122.36); other revisions may be ordered by the Board.



Steven R. Ritchie
Executive Officer

Attachment: Part A (August 1993)